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To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interests of Lake Carriers, and improve the character of the service rendered to the public.

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INADEQUATE DRY DOCKS.

In the event of war between the United States and a foreign power, the operations of the American Navy would be seriously hampered by the lack of dry dock facilities. This is particularly true of the North Atlantic Squadron. There is to-day not a dock on the Atlantic coast in which battleships could be placed, and it is doubtful if any of the larger cruisers, if injured and of deep draft through leaking, etc., could be docked in any of the structures which are available.

Secretary Long declares that the most urgent need of the naval service is an increase of dry docking facilities. Of the eleven government docks—nine on the Atlantic and two on the Pacific coast—three were designed to accommodate battleships of the first class, one at New York, one at Port Royal, S. C., and one at Bremerton, Wash., on Puget Sound.

It is not believed that the Brooklyn dry dock No. 3 will be ready for service until the entrance has been rebuilt, and at least six months and probably longer will be required to perform the work satisfactorily. There is not only an insufficiency of water at the entrance to the Port Royal dry dock, but the cross section of the dock is too small to safely admit batttleships with bilge keels affixed. There is but one dock on the Pacific coast of sufficient size to dock a modern battleship. This is on Puget Sound, 900 miles from San Francisco. Access to it is through a narrow channel, the Straits of Juan de Fuca, 20 miles long, one side of which is in possession of a foreign country. The Indiana and Massachusetts were docked some months ago, the former at Halifax and the latter in dry dock No. 3. just before the Brooklyn structure developed defects. It is recognized by the naval authorities that Great Britain would not permit the United States men-of-war to use Canadian or English docks during the progress of a war between the United States and a foreign power and this government would consequently be thrown on its own resources.

Besides the docks mentioned above, the government owns a worn-out floating wooden dock, at Portsmouth, N. H., which was built in 1851; a small and insufficient dock of stone at Boston, laid over fifty years ago; dry dock No. 2, at the Brooklyn Navy Yard, which is considered to be the best dock in service, but which is deteriorating and besides is too small to accommodate the battleships; a dry dock at League Island, two dry docks at Norfolk and one at Mare Island.

In his annual report and in a subsequent communication to the Senate and House Naval Committees, Secretary Long urgued that docks be constructed at Boston, Portsmouth, N. H., and Mare Island, Cal.; that dry dock No. 2 at the New York Navy Yard, be fitted with a concrete entrance and widened sufficiently to accommodate our largest battleships; that the present timber dry dock at League Island be widened and provided with a concrete entrance; and that at Norfolk the short dock be lengthened 150 feet, which will enable it to accommodate all except the very largest ships.

NEW TONNAGE ENROLLED.

Official numbers were assigned thirty-nine craft by the Bureau of Navigation, Treasury Department, Washington, D. C., during the week ended April 9. The steamer William R. Linn, built by the Chicago Ship Building Co. and hailing from that port, measures 4,328.71 tons gross and 3,196.99 tons nets, which is a larger tonnage than the combined capacity of the eleven other craft built this year and registered for the week. In addition to the Linn there is the Gen. John M. Wilson, built at and hailing from Toledo. This is the survey boat built by the Craig Ship Building Co. for the use of the U. S. engineer department, at Buffalo, and she measures 42 tons gross or 29 tons net. Four canal barges averaging about 200 tons each are registered at Buffalo and twenty-three scows ranging from 50 to 200 tons each, most of which have been built at Duluth, at periods since 1871, have been given official numbers and therefore class as U. S. tonnage. This fleet of scows are registered as Scow No. 1, official number 67,337 and so on up to 67,359.

COAL OUTPUT.

From a statement, compiled by E. W. Parker, statistician of the United States Geological Survey, it is shown that the total output of coal in the United States in 1897 amounted approximately to 198,250,000 short tons, with an aggregate value of $198,100,000, a fraction less than $1 per ton. Compared with 1896 this shows an increase in tonnage of 6,270,000 tons, or about 3.3 per cent. The increase in the value of the product was only $1,700,000, a little less than 9 of 1 per cent. The amount of coal produced in 1897 was the largest on record. The average value per ton was the lowest ever known, continuing the declining tendency which has shown without any reaction for the past six years.

The increase in production and the decline in value was confined to the output of bituminous coal. The anthracite production in Pennsylvania decreased nearly two and a quarter million tons, from 54,346,081 short tons of 2,000 pounds, to 52,122,408 short tons in 1897, while the average price received at the mines per short ton was $1.65 ($1.85 per long ton) in both years. This is not an increase, but it is much better than a loss, one cent per ton meaning a total of more than half a million of dollars. The marketable product of anthracite coal in Pennsylvania during 1897 was 42,637,864 long tons against 44,188,460 long tons in 1896.

SAND BARS IN PORTAGE CANAL.

G. A. Marr, superintendent of canals, at Houghton, reports the usual sand bar in the upper canal extending from the west to very near the center. A flag buoy has been placed on the west and a red buoy on the east, marking a channel from 16 to 20 feet deep.

FRENCH SHIPPING BOUNTIES.

Mr. H. E. O'Neill, the British Consul at Rouen, in the course of his annual report on the trade, etc., of Rouen for the year 1897, writes as follows: "Last year I reported the more than shaky condition reached by the Chantiers de Normandie, or dockyard of Rouen. A number of sound, well-built ships (as their first voyage proved) had been launched from it, but most of these were constructed at a loss. I gave a list of eleven steel three and four-masted sailing ships, of from 2,000 to 3,000 tons, seven of which had been launched in March last. As funds to finish the four that remained on the stocks were not forthcoming, a meeting of shareholders was called to examine the books and decide on the best course to pursue. Despite the bounty on construction, which exceeds £5,000 ($25,000) on a 2,000-ton ship, it was found that on the building of one vessel, the Dunkerque, there had been a loss of more than 140,000 francs. An issue has already been made of bonds secured upon the property of the yard, and it was impossible to raise more money in that manner. Nothing was left but to form a new company, and enough capital to finish the ships on the stocks was only secured by an issue of shares which were almost entirely taken up by the shipowners to whom these vessels were to have been delivered. The original shareholders were allowed in the new company shares to the value of one-fifth of the original investment, thus losing four-fifths of their capital. With the fresh capital thus raised the four ships then on the stocks have been completed. But no more orders are taken, all the slips are vacant, and work has practically ceased in the yard. Astonishing though it must seem to British shipbuilders, whose yards are alive and active without any bounty, French capital persistently refuses too look any more at this yard as an investment, and efforts are now being made to induce foreign capitalists to take it over. Doubts being expressed whether the bounty on construction would be paid if the yard were in the hands of foreigners, the directors of the present company, supported by the Prefet, the Mayor of Rouen, and by the President of the Chamber of Commerce, waited upon the Minister of Commerce at Paris and obtained from him an affirmative and re-assuring opinion on this point. Notwithstanding this assurance, I learn that negotiations with a Dutch shipbuilding company have fallen through, and at the present moment it appears not unlikely that the Chantiers de Normandie, with its five ships and all its equipment barely five years old, will be broken up. Last year I spoke of the difficulty experienced in raising £20,000 ($100,000) to build, and run as a commercial undertaking, although the navigation bounty (1f. 70c. a ton per 1,000 miles run) would allow her to sail about the world for some years with empty holds without actual loss. The vessel was ultimately completed, but it was only done by the issue of bonds morgaging her before she had left the stocks. In certain industries we have seen foreign manufacturers jumping the fence of protective duties, and establishing factories on French soil to produce for the French market. British shipbuilders do not seem inclined to follow this lead. So far, French shipowners have gone to England to buy their merchant steamers. But it may be well to remember that this demand on British yards may not continue. Protective legislation has already succeeded in placing in French hands the building of large freight-carrying steel sailing ships, and there are clear signs that a strong effort will be made before long to encourage the building of steamers in France by a further increase in their navigation bounty."

THE loss inflicted upon our merchant marine during our civil war by Confederate cruisers is estimated at $10,000,000, vessels of 80,000 tons in all being taken, most of them with cargoes. During the same period 800,000 tons of our best shipping worth $40,000,000 was sold abroad.

NEWS AROUND THE LAKES.

CHICAGO.

Special Correspondence to The Marine Record.

Lydon & Drews' new tug Harry Lydon arrived here from Benton Harbor on Sunday afternoon.

A. L. Fitch chartered the steamer J. J. Hill for barley to Lake Ontario at 2½ cents free of tolls.

The tug A. A. Carpenter is in the Independent Tug Line's floating dry dock receiving a general overhauling.

The Craig Ship Building Co., of Toledo, O., will build the new steel fire boat for Chicago on their bid of $49,950.

J. J. Rardon & Co. chartered the steamer Mecosta for corn to Buffalo at 1¼ cents, steamer City of London for oats to Buffalo at 1 cent.

Grain rates dropped on Monday to 1 cent on large cargoes at handy elevators. Charters aggregating 1,000,000 bushels was done at that rate.

The grain trade was flat here on Tuesday with Buffalo corn at 1 and 1⅛c., according to the size of vessels and location of elevators. Most, if not every one of the winter fleet, will have cleared by the end of the week.

The Susquehanna, of the Anchor Line, opened the season for the Buffalo lines on Tuesday by bringing a large cargo of general merchandise. A much larger volume of business is expected by the lines in west-bound merchandise this season than for several years past.

At Miller Bros.' shipyard the tug J. V. Taylor was in dock for some new bottom plank,re-calking and ironing; the steamer O. E. Parks was in for calking, repairs to stern bearing and a new wheel. The schooner Ralph Campbell was in for searching up and calking butts.

Capt. John Prindiville chartered the steamer Pontiac for oats at 1 cent and rye at 1¼ cents from South Chicago to Buffalo, steamer Frontenac for corn to Buffalo, steamer Cadillac for corn to Kingston at 2¾ cents, steamer Kaliyuga and consort Frontenac for corn to Erie at 1⅛ cents.

The steamer City of Bangor, when going down the south branch of Chicago river, Friday night, grounded on Washington street tunnel at midnight and remained aground until 8:50 Saturday evening when she was released by the Independent Tug Line tugs Dickinson, Charnley and Crawford.

Capt. George Weaver will leave here this week with the tug J. V. Taylor, for Charlevoix, where he will use her for general towing purposes. The Taylor has been in dry-dock and received a thorough overhauling. Capt. Weaver has the best wishes of his many friends for success in his new venture.

The Graham & Morton Trans. Co. commenced on Monday, April 18th, making daily trips between Chicago and St. Joseph and Benton Harbor, with their steamer City of Louisville, leaving Chicago at 12 o'clock, noon, on all-week days, except Saturdays, when she leaves at 11:30 p. m. No boat on Sundays.

The Dunham Towing and Wrecking Co. have sold the tug Bob Teed to Capt. Chas. Hale, who will take her to Ashland, Lake Superior, this week. Capt. Hale is well known and respected in this city, he having been master of the steam yacht Alcyone, of this port, for a number of years. His many friends wish him success in his new enterprise.

Kingston is a favorite route now, many shippers wishing to protect their interests by sending grain via Montreal so that they will not be caught by having the port blocked in event of war. Leiter wheat is moving freely. The amount of room taken in two days is put at 1,000,000 bushels. Many vessels are placed to load five and six days ahead and these charters are generally withheld.

The barge Plymouth, one of the consorts of the steamer Arizona, which was compelled to run back before a heavy northeast gale on Sunday, was being assisted into port by the tug Dickinson and when entering the piers her tow line parted and she took a sheer and ran into the barge Celtic, tied up at the north pier, doing considerable damage to the Celtic and also to her own bow.

Harbor Master John Roberts has issued an order this week that all craft, larger than the small lumber steamers,be compelled to take the assistance of tugs when passing State St. bridge. The bridge, which is swung open, is being held on jack screws, while the center pier foundation is being rebuilt, and it is feared that if a vessel should strike the bridge it would topple over into the river.

The steamer Escanaba, laden with wheat for Buffalo, was seized by a deputy sheriff and several police officers on Friday, just as she was about to leave port, on a claim of the city for $1,000 for damages caused by the steamer running into the Canal street bridge last fall. The Escanaba was released Friday night on a bond for $2,100 furnished by Capt. Samuel R. Chamberlain, master of the steamer, with the National Surety Co. as security.

It is the riveters' turn at the yards of the Chicago Ship Building Co. now. They object to the riveting machines being brought into use. It is a foregone conclusion that any kick made against the use of improved machinery is useless. With lake freights at their present level there is no haste to get the boat into service, and no effort is being made to settle the strike by the company. It is safe to say that when there is any urgency for rivets to be riveted the work will be done.

The Dunham Towing and Wrecking Co. towed the steamers Milwaukee, Spokane, Chili, Fayette Brown, and Wm. B. Morley to the Alton elevator; the steamer J. J. McWilliams to Armour's E elevator; steamer Fedora to the Wabash and Keith's elevator; steamer John Craig to the Union elevator; steamer Ramapo to the Santa Fe and Indiana elevators; steamer George T. Hope to the Santa Fe elevator; schooner J. C. Fitzpatrick to the Columbia elevator; steamer Neosho to the Central and Armour's A and B elevators.

The Independent Tug Line, of Chicago, have purchased the large tugs Prodigy and Tomlinson from the Barry Towing and Wrecking Co., of Duluth, and will station them at South Chicago, which field they intend to operate in the future in connection with their Chicago line. The Prodigy and Tomlinson are two of the finest and most powerful tugs on the lakes and will make a great addition to their already well known fleet of tugs at this port. The Prodigy and Tomlinson left Duluth for Chicago this week. The Tomlinson is towing a large scow for the Youghiogheny & Lehigh Coal Co. to be used in fueling vessels at this port.

The stocks of grain in Chicago elevators last Saturday evening were 5,306,000 bushels of wheat, 16,636,000 bushels of corn, 913,000 bushels of oats, 441,000 bushels of rye, and 251,000 bushels of barley. Total 23,547,000 bushels of all kinds of grain, against 25,662,000 a year ago. For the same date the secretary of the Chicago Board of Trade states the visible supply of grain in the United States and Canada as 29,154,000 bushels of wheat, 34,917,000 bushels of corn, 12,746,000 bushels of oats, 3,076,000 bushels of rye, and 1,095,000 bushels of barley. These figures are smaller than the corresponding ones of a week ago by 975,000 bushels of wheat, 5,183,000 bushels of corn, 794,000 bushels of oats, 435,000 bushels of rye, and 42,000 bushels of barley. The visible supply of wheat for the corresponding week of a year ago increased 7,825,000 bushels.

BUFFALO.

Special Correspondence to The Marine Record.

Not finding any up freight the steamer Livingstone will remain here until chartering is more brisk.

On weighing out at Buffalo the corn cargo of the steamer S. J. Macy ran 700 bushels short. The missing grain was traced to the elevator from which the shipment had been made.

Of the corn cargo of the steamer Merida, which had her plating crushed while passing through the ice at the east end of the Straits, 13,660 bushels were found wet on discharging at Buffalo. The damaged grain brought 22 cents per bushel, a loss of about one-third.

It is reported from St. Paul that the government is after the steamers North West and North Land, of the Northern Steamship Co., which operates between Duluth and this port. These two steamers are capable of making over 20 miles an hour, are steel built and have been used exclusively for passenger service, so that if secured by the government it is thought they would probably be used as troop ships. President J. J. Hill, of the Great Northern railroad, who is also at the head of the steamship company, is in Europe,and cannot be seen to affirm or deny the truth of this report, while other officers of the company have nothing to say in the matter.

DETROIT.

Special Correspondence to The Marine Record.

Harbormaster O'Neill has had life-buoys placed at various stations along the river front.

The steam barge Tecumseh, which plies between the Georgian Bay and Buffalo, is getting new boilers fitted in at Windsor. The barge United Lumberman is loading at the M. C. R. dock.

The D. & C. Line boat was three hours behind her time on account of the gale on Tuesday night. She took the south passage and made good weather on the longer route. It is very seldom these boats depart from their regular course on account of heavy weather.

General Manager Carter, of the D. & C. Line, says that the war talk has caused the traffic on the ocean liners to dwindle down to almost nothing. He thinks the trouble will in all probability benefit the D. & C. Line, as the summer tourists will be more apt to seek the northern resorts in preference to going to the sea shore.

Work at the dry docks have been fairly brisk this week. The barge Armenia has had repairs made to her rudder post and the steamer Bulgaria also stopped for some work to be done on her. The steamer Niagara in backing out of the dry dock got her fender under the tug Balize and caused a $400 damage. The Senator also received repairs.

The steamer Thomas Maytham, of Buffalo, bound down with a tow collided with the steamer Atlantis, owned by John Stevenson, of Detroit, on Tuesday afternoon. The Atlantis was coming up the river; her bow was damaged, but she proceeded on her trip to Port Huron. It was found, on survey, that she was not much hurt in the collision.

About a year ago a number of young men at Port Huron organized themselves into a naval reserve corps. They made application to be mustered in, but that is all that ever was done. Many considered the affair a joke. Orders were received yesterday to hold themselves in readiness to leave for the coast at a moment's notice. Now the reserves are surprised and wonder what it all means.

The following report from Saginaw shows the extent to which the movement of lumber to market has been diverted from water to rail routes. Last year the mills on the river produced 353,306,349 feet of lumber; the water shipments were 89,137,511 feet, and the rail shipments were 382,390,000 feet. Every lumber firm on the river ships a portion of its products by rail, and a number of them ship exclusively.

It is rumored that the Graham & Morton Line, of Benton Harbor, propose sending their large side-wheeler City of Chicago, to run between Detroit and Cleveland. This will be by way of retaliation for the sending of the State of Ohio on the Chicago-St. Joe route by the C. & B. Line. Manager Carter, of the D. & C., said he had heard nothing of it. "I don't see why they should have it in for us," said he; "we have no interest whatever in the State of Ohio. However, if they do come up here we are just the boys who can give 'em a good time when it comes to cutting rates."

E. A. Dustin is quoted in the Journal as saying that ocean captains are simply navigators, and are not in it with lake captains when it comes to handling a boat. He was shocked when on board the City of Paris to hear the captain ordering some one to throw out a rope. A man that would call a line a rope on a lake steamer would be considered a farmer. When the City of Berlin wanted to get alongside of the City of Paris it took them a very long time, and they had to get ropes out fore and aft and pull them together, and when they got them together they thought they had accomplished a wonderful feat. The North Land and North West are run alongside of each other frequently, and they do not think anything of it either. Ocean captains, he says, are good enough to figure out examples to locate themselves by the sun, but lake captains can walk all round them when it comes to handling a vessel.

PORT HURON.

Special Correspondence to The Marine Record.

F. D. Jenks & Co. received their first cargo of lumber for the season on Friday last.

The steamer Garden City has been sold by Gilchrist, of Alpena, to Boland & Hagen, of Buffalo.

There is quite a lot of work at the Dunford & Alverson dock in repairing and fitting out vessels.

Owing to the engineer making a mistake in the signal bells, the T. D. Stimson ran into the river steamer Mary, doing considerable damage.

The local steamboat inspectors, Capt. Frank Danger and Mr. Van Liew, have been as far north as Alpena, on an inspection tour. This is the busy season for all of the local inspectors.

The last rumor regarding the Unique, is, that Chicago parties have purchased her. In any case, nothing has been heard lately about the nearly closed Canadian deal whereby she was to be taken to Lake Ontario.

Nearly all of the vessels that wintered at this port have been fitted out. There is some of the old class of small tonnage that won't leave port for some weeks yet and even then it is difficult to see where they can procure a paying freight.

Charles R. Brown, who holds patents for a Camel wrecking device, has been in correspondence with the government authorities during the past two weeks. He believes that with one of his wrecking devices he can raise the U. S. S. Maine, sunk in Havana harbor, and that the device would prove of great benefit to the United States. Congressman Snover has interested himself in the scheme and has brought the matter before the Secretary of the Navy. Mr. Brown is in receipt of several letters from Secretary Long and will leave this week for Washington to present his plan before that official.

Capt. J. C. Holmes, who a year ago was hard at work on a scheme to sail around the world in an 18-foot skiff, is at Dawson City, Alaska. He left here in August last and has turned up in the gold regions of the north country. Mrs. Holmes in in receipt of a letter from her husband, dated at Dawson City, March 1st, in which he says he is enjoying the best of health. He has located a good claim on Quartz Creek, which pays him $40 per day, clear of expenses. He has an interest in mine 185 at Dominion Creek, which will be opened in June, and a claim in Chief Gulch, which he will dispose of owing to lack of time to operate it. The captain reports provisions very scarce. He has paid $600 for three 50-pound sacks of flour. The first mail to arrive at Dawson City, during the winter, was on February 28th.

CLEVELAND.

Special Correspondence to the Marine Record.

Several cargoes of coal have reached Duluth this week and Lake Superior is again free to navigation.

Some chartering has been done this week at 60 cents from the head of the lakes and 50 cents from Marquette.

Mr. Robert Logan, consulting engineer and marine expert, has returned home after an absence of several days at other lake ports.

At the Cleveland dry dock the Olive Jeanette is in for calking topsides and will be followed to-morrow by two large scows which will be docked at the same time.

Mr. George Quayle, late general manager of the Ship Owners' Dry Dock Co., is in town this week. Mr. Quayle looks better than ever, and is enjoying excellent health.

The lowest freight ever paid on iron ore is the eighteen cent rate Escanaba to South Chicago; if two and a half

cents is paid for trimming the charter can still read free in and out.

It is now expected that the Bessemer Line boats building at the yards of F. W. Wheeler & Co., West Bay City, will be completed by the first of August. The yards are running on overtime and every effort is being made to push the work well ahead.

The L. R. Doty is docked at the Ship Owners' dry dock for new stern post and rudder, also new ironing forward to repair ice damage; the Empire State is docked for a general overhauling, calking, etc., to be followed by the Badger State for similar work.

Freight rates on iron ore have simmered down this week to 55 cents from the head of the lakes, 50 cents from Marquette, and 40 cents from Escanaba to Lake Erie ports. What little chartering has been done in coal, has been at twenty cents all around.

The local inspectors of steamboats, Messrs. DeWolf and McGrath, visited Toledo, on Thursday, to inspect the new government survey boat Gen. John M. Wilson and other craft. Assistant local inspectors, Messrs. Judson and Plietz, inspected the Arrow, at Sandusky, on Wednesday.

Work at the yards of the Globe Iron Works Co. is very brisk. Every department, including the engine shops and boiler works are working on full time, and, with the new contract secured this week for the construction of a large twin screw car ferry, work is assured for a few hundred men for the season.

The car ferry Shenango No. 1, went into dry dock at Lorain, on Monday. Owing to the peculiar construction of the craft it was necessary to make alterations in the dock to receive her. The top portion of about thirty keel blocks was removed, and a one-foot block added to the bilge blocks on which she rests.

The 30-ton, six inch steel gun cast at the Otis Steel Works last August, under the direction of Dr. R. J. Gatling, has been finished. It was shipped to the Washington Navy Yard this week. It will be rifled and taken to the Indian Head proving grounds to be tested. This port could take care of quite a lot more orders of this sort.

One of the busiest shipyards on the lakes at this time (and they are all working pretty lively) is the Lorain yards of the Cleveland Ship Building Co. With four large modern steel steamers under construction and an immense quantity of repair work this company is fast becoming an important State industry. The local plant has nearly all the work that it can attend to, though of course the several hundred men employed at the shipyard is in excess of the number on the staff here. Cleveland is building and being improved to the west and if Lorain will but work away to the eastward a trifle smarter there may be a chance for annexation and a consequent merging of that bustling little city into a Greater Cleveland.

The J. H. Devereux and the J. H. Wade, owned by the Cleveland Rolling Mill Co., were the first boats to load ore this season at Escanaba and Marquette respectively. The Cambria, of the Mutual Line, was the first ore arrival at Ashtabula, closely following the Devereux's Cleveland cargo. The wooden steamer City of Paris was the first boat to reach Duluth coal laden from the lower lakes, reaching there very early last Saturday morning. Of course there was no advantage to be gained by her getting to the dock late on Friday night, so it was made a. m. Saturday, when people would be ready for work. The departures from Duluth, Maruba and 118, grain laden, also took advantage of the early morning slant to start down Lake Suuperior.

Cleveland may be called upon to furnish a part of the auxiliary fleet now being brought together by the government. H. C. Graves, of the branch hydrographic office, has been gathering data concerning available vessels. The new tug H. D. Goulder, now in Buffalo ready to be turned over to her Cleveland owners, is one of the most powerful of her kind afloat. The Kennedy is another staunch tug whose services would be valuable. Several yachts owned here could be pressed into the service, chiefly among them the Comanche, H. M. Hanna's yacht; J. H. Wade's Wadena, now in New York, and possibly W. J. White's Say When. These boats are to be used to cruise in the rivers and inlets along the coast of Cuba, where light-draft vessels would be required. Altogether there are over a hundred tugs and other craft suitable for this purpose located along the lakes.

FLOTSAM, JETSAM AND LAGAN.

The ice at Port Arthur, Lake Superior, is moving out and navigation will be open in a few days.

The car-carrying barges are again being operated between Sandusky and Detroit. The tug Champion tows them.

D. L. McKinnon intends running the steamer City of Windsor between Sault Ste. Marie and the Michipicoten gold mines.

The steel steamer J. H. Wade opened the season at Marquette, arriving there last Saturday, ten days earlier than last year.

The steamer Queen of the West, corn laden for Kingston, arrived at Port Colborne Saturday. She is the first of the Chicago grain fleet for Lake Ontario.

The Raddatz submarine boat, taken from Oskosh to Milwaukee, will be tested in the lake in a few days. After the test she will probably be taken to the coast.

The steamer Joliet, the first coal laden boat, arrived at Marquette on Monday. The steamers William Chisholm and Griffin were among the earliest boats to load ore.

C. H. Keep, secretary of the Lake Carriers' Association, has been appointed secretary of the Buffalo Merchants' Exchange. The new position pays a salary of about $1,800 a year.

It is now said that the amount of grain under charter at Duluth is fully 4,000,000 bushels, and probably more. One authority places it at 4,500,000 bushels. The freight rate on wheat to Buffalo is 1⅜ cents.

Capt. James Reid, of Bay City, says that he will resume operation on the sunken Cayuga as soon as he can use his tug, G. H. Parker, which is being rebuilt, and he has no doubt of his ultimate success in raising the Cayuga.

Capt. J. H. Rodgers, of the revenue cutter Fessenden, has been detached, and his position will be taken by Capt. A. B. Davis, who has been on the Gresham. It is thought that Capt. Rogers will be given charge of the light-house district service.

There are four big wooden boats on the ways at James Davidson's yards, all of which will be launched in the course of a month. One of these vessels will be launched next Saturday, and the others will follow at intervals of about a week apart.

The Canadian government is to put in for the Parry Sound route a gas buoy at Sequin bank and one at Gordon rock, in addition to the light already there. They will also put up one more special range of lights and twenty additional channel buoys, so there will be no difficulty in getting into Parry Sound harbor either by day or night.

The old steamer Maine, owned by A. C. McLean, of Saginaw, which burned recently at Tonawanda, has an interesting history. She was originally one of the famous old Ogdensburg Transportation Co.'s fleet. She was built at Cleveland in 1872 and measured 255 tons, rated A2, and had an insurance valuation of $17,000, though the amount of her insurance, $13,000, represented more than she could have been sold for at any time during the past few years.

There appears to be some misunderstanding among many masters and pilots as to the examination they will have to undergo before the local steamboat inspectors upon the renewal of their licenses. All that will be required is an examination in writing sufficient to show that the officers are thoroughly familiar with the pilot rules upon the waters for which they are licensed; that is, they must know something about the provisions of the "White" law.

The American Ship Windlass Co., Providence, R. I., have just supplied an order for three automatic steam towing machines, one to the Delaware River Iron Ship Building & Engine Works for the steamer that they are building for the Standard Oil Co., one to the Chicago Ship Building Co. for the steel barge under construction to the order of the Minnesota Steamship Co., Cleveland, and one to Lewis Luckenbach for a powerful tug he is having built for coast service.

Very little coal is yet moving up the lakes, nor is there much prospect of any further increase in the business during the next ten days. One cause of this is to be found in the tax laws of Illinois. At Chicago the assessor makes his rounds May 1. On that date he assesses all the coal which he finds on the docks, and lets it go at that for another year. There is, therefore, an obvious reason for having the coal supply at Chicago as low as possible at the beginning of May.

The Bethlehem Iron Co., South Bethlehem, Pa., have been given the order for the shafts for the engines which the Metropolitan Traction Co., of New York City, will install in their new power house. These shafts are 37″ in diameter, 27′-4″ long, with a 16″ hole through them. They are made of fluid compressed open hearth steel, annealed, and are hydraulically forged on a mandrel. The Bethlehem Iron Co. is the only forge in this country equipped for turning out work of this character and magnitude. The cranks will also be made by this company.

The Roberts Safety Water Tube Boiler Co., of Red Bank, N. J., and 39 and 41 Cortlandt street, New York City, have built and shipped forty-two of their boilers, this winter, in 137 working days, and they are still working night and day. These boilers range from 10 horse-power to 600 horse-power each and are used in vessels ranging from steam launches to large passenger and freight steamers—upwards of 2,000 horse-power being installed in one vessel. This shows an output of a boiler of average size in an average time of less than three and one-half days. Is there any other boiler concern in the United States that can equal it?

What is reported as being the cheapest transportation rate in the world is carrying iron ore from Escanaba to the Illinois Steel Co., at South Chicago. The haul is 260 miles, and there are no return cargoes, vessels steaming flying light in one direction every trip. For this service they are getting 18 cents a ton this season. Out of that amount there is an expense of 2½ cents per ton if the cargo is trimmed by the Escanaba union. Not many years ago $1.25 was paid for bringing ore from Escanaba, though at that time hundreds of tons were carried in one bottom where now it runs up into the thousands.

The Union Line steamer Starrucca came to anchor last week in thirty fathoms of water off Racine in a sudden and unexpected manner. The gale from the north had caused a heavy head sea, into which the steamer headed; the windlass became unlocked and one of the patent stockless anchors ran out. When the anchor fetched up, the headway of the steamer caused the entire scope of ninety fathoms of chain to run out. Fortunately the fastening of the end of the chain proved to be secure, otherwise anchor and chain would had to have been dragged for, as it was, the strain upon the heavy cable brought the Starrucca up all standing, and then the steam windlass made short work of restoring it to the locker and the anchor to its place in the hawsepipe.

CASUALTIES OF THE WEEK.

In a heavy snowstorm on Tuesday afternoon the schooner Chicago Board of Trade, Cleveland to Harbor Springs, with coal, went ashore at Lighthouse Point, Straits of Mackinac. While abreast of the point the rudder was unshipped, the sails jibed and the boat became unmanageable. The schooner now rests on a sandy bottom and is full of water. She has 800 tons of coal on board. Assistance was promptly sent to her and it is expected that she will be released without much damage.

Capt. W. C. Richardson, Cleveland, managing owner of the steamer J. H. Outhwaite and schooner H. A. Barr, received the following dispatch from Capt. Burke, master of the Outhwaite: While trying to make Presque Isle for shelter the Outhwaite's pumps gave out, which disabled the steamer. The sea being heavy and the wind strong, both vessels were driven ashore off False Presque Isle in an exposed position. The Outhwaite is broken in two forward of the boiler house. A dispatch from Capt. McClennan, keeper of the Middle Island life-saving station, stated that the steamer appeared to be broken in two and that the schooner was in fair condition. The boats were insured with the Prime-McCurdy syndicate, the Outhwaite for $70,000 and the Barr for $50,000. A special from Alpena, says:

In the heavy easterly gale on Tuesday afternoon the steamer J. H. Outhwaite and consort, the schooner H. A. Barr, were driven ashore on False Presque Isle Point. Signals of distress from the vessels were responded to by the Middle Island life-saving crew, who, after the most heroic efforts, finally succeeded in reaching the vessels. Both life savers and the crews of the vessel remained on the stranded craft all night, with the waves breaking over them continually. Wednesday morning, when the sea had run down, both crews were brought ashore. The shipwrecked sailors are now being cared for at the Middle Island life saving station. It is thought that the steamer will prove a total loss. The schooner lies in a better position, but the task of releasing her will prove expensive. The steamer lies across a reef and appears to be broken in two.

The Outhwaite and Barr were bound up Lake Huron without cargo. They were caught in the east gale which raged all day Tuesday, and in their light trim rolled heavily. They made fairly good weather of it, however, in spite of the heavy seas, and the captain of the Outhwaite determined not to seek shelter, but to push on to the Straits.

About 4 o'clock in the afternoon the engine on the Outhwaite showed signs of giving out, and soon broke down altogether. Helpless on a lee shore, both vessels were driven on to the beach.

Although the Barr is a large vessel, she lies in only four feet of water, so high up did the seas drive her. No effort can be made to release either boat until the sea runs down.

Hydraulic jacks must be resorted to to save the Barr, and it is more than probable that the Outhwaite will be a total loss.

Both are wooden vessels and belong to the class that is rapidly being displaced by the modern steel carriers. The Outhwaite measured 1,304 tons, being 224 feet long and built in 1886. The Barr is a comparatively new tow barge, being built in 1893, and measuring 1,119 tons.

The Outhwaite and Barr left Detroit Saturday and were bound for Marquette for ore.

The powerful wrecking tug Favorite was promptly ordered to the rescue of the Outhwaite and Barr.

BY LAKE FROM PITTSBURG.

Andrew Carnegie evidently expects to develop on a large scale shipments of iron and steel products from Pittsburg by way of his railway to the port of Conneaut on Lake Erie, and thence by lake and canal to the east. In a recent communication he says:

"We are upon the threshold of another important advantage. The Erie canal is being deepened to nine feet. When this is done the cost of transportation between Pittsburg and New York, Boston and all northeastern points will be less than one-half of present rates for seven busy months of the year. Barges between Conneaut and New York will leave each point daily, and to transport the products from Pittsburg to Conneaut in cars which would otherwise move empty to the lakes for ore, will cost little. A canal transporter has given me 75 cents per ton by barge line from Conneaut to New York as his price upon the deepened canal. Between Conneaut, Milwaukee, Chicago and other lake ports transportation will not cost more. When these lines are established and the Ohio is improved, Pittsburg will be the best distributing, as it is now the best manufacturing point in the United States."

DRY DOCK LIABILITY.

There is no doubt but that ship repairers, dry dock companies, tow boat lines and others engaged in marine business, must live up to their contracts and faithfully perform the work, stipulated or implied, undertaken by them.

During the past week much interest has been expressed relative to the decision rendered in favor of the Goodrich Transportation Co. and against the Milwaukee Dry Dock Co., for damage resulting to the steamer Muskegon, belonging to the Goodrich line, while she was in dock.

What made the suit of more interest was the fact that it was the first time the question of the liability of a dry dock company, was ever brought up in court, on the lakes. Dozens of expert witnesses were brought forward on both sides ; and pictures were shown of the Muskegon as she lay in the dock after the accident.

The Goodrich line took the position that the damage to their steamer was brought about by careless handling of the ship, in placing her on the blocks. They assumed that the dry dock employes had full charge of the steamer from the time she entered the dock, and any accident must of necessity be due to their negligence. The dry dock people claimed that the reason the steamer slipped from the blocks into the dock, was that the steamer's engineer had caused the accident by commencing work inside of the steamer, before the weight of the boat had been settled on the blocks. The court held that the premises of the Goodrich line were correct.

When the Muskegon fell in the dock, her "back was broken." The hull was repaired sufficiently to float, and the steamer's owners abandoned the craft to the dry dock people. They took her back afterwards and rebuilt her, under a mutual understanding, while the suit was pending.

Such a decision was clearly anticipated by the Goodrich Co., and while the owners of the dry dock no doubt thought there were certain circumstances which might have been urged in mitigation of their apparent oversight and consequent damage to the hull of the steamer, yet the conclusion to most minds must have been almost a foregone one. A similar case has just been closed in the admiralty courts at London this month, according to the following digest:

The Atlantic Transport Co., limited, sued the Ocean Dry Docks Co., limited, of Swansea, for damages for injury sustained by their vessel, the S. S. Montana, while being placed in defendants' graving dock in November last. On 14th November, in pursuance of a contract between the parties, the vessel entered the central graving dock to be cleaned and painted. The operation of docking was performed under the directions and orders of defendants' servants, who negligently placed the ship in such an improper position on the blocks that she slipped off and sustained very great damage.

The Montana was docked askew, and the fore and aft line of her keel was not placed parallel with the dock sides, nor in the same vertical plane as the centre line of the blocks at the bottom of the dock. Defendants denied negligence on their part, and alleged that the casualty was caused by plaintiff's negligence in bringing the vessel into dock in the dark with a heavy list to starboard and with cargo in her, without informing their servants of her condition, and in that they blew or ran water out of the port boiler while the vessel was in dock, thus increasing the list. Defendants counterclaimed £3,104 18s. 9d. for services rendered, and £160 for damage to blocks. His Lordship (Mr. Justice Barnes) held that the vessel was docked askew—that she was docked with her stern sufficiently on the blocks to remain there afterwards, but with her bows either on the edge, or so near the edge, that she was not properly supported by each block, and in consequence of the weight of the ship she cut off the forward edge of the blocks until she dropped. He was of the opinion that proper precautions were not taken to make sure that the ship was placed evenly on the blocks, allowing for the list she had, and that therefore the damage was due to the negligence of defendants' servants. He gave judgment for plaintiffs on the claim, and also on the counterclaim with the exception of £476.

LIBELS DISMISSED.

Judge Swan, of Detroit, has dismissed the libel and cross-libel which arouse out of the collision between the Wilson Transit Co.'s steamer Charlemagne Tower and John E. Mills & Co.'s steamer Nelson Mills and consorts, and the court also handed down the opinion covering both cases.

About noon on August 27, 1895, the steamer Nelson Mills and her tow, consisting of the barges Goshawk and City of the Straits and schooner Hattie, all light and bound up, reached the dike of the lower end of Hay Lake channel, St. Mary's river. Owing to the influence of a strong northerly wind the current abreast of the dike was about five miles an hour, much more than its usual velocity. The tow was proceeding at the rate of one and one half miles an hour. Shortly after getting abreast of the dike the wind shifted more to the northeast in a squall of considerable violence, the tow drifting to leeward. When half way up the dike, which is about one and one-eighth miles in length, the Tower was sighted coming down at full speed. The Mills gave one blast of her whistle, which signal was answered by the down-bound steamer by one blast. As the steamers passed, port to port, the Mills was within fifteen feet to the windward of the stakes, and the Tower passed her within about ten feet. After clearing the Mills, the Tower, with her wheel at starboard, drew in toward the tow so as to rub the Goshawk. Next she struck the port bow of the City of the Straits with the bluff of her port bow, causing considerable damage to both the barge and herself, and for these damages the libels were filed.

It is claimed that the Tower, being loaded with 1,600 tons of ore and drawing forteen feet, should have kept further away and also checked down when approaching the tow, the allegation being made that she was running faster than is allowed in river navigation in such close quarters. On behalf of the Tower, it was claimed that she checked down, but that owing to the length of the tow lines of the Mills fleet—from 350 to 400 feet—being unsafe in river towing, the consorts drifted so much to leeward as to lay across the larger portion of the channel. The Tower herself, it was claimed, was affected by the squall, but her officers did the best they could under the circumstances to avoid a collision.

The original libel was filed by John E. Mills et al. against the steamer Charlemagne Tower, and the Wilson Transit Co. filed a cross-libel against the Nelson Mills.

VESSELS CLASSED.

The American Shipmasters' Association have classed or rated this week in the "Record of American and Foreign Shipping" the following named vessels: Brig, Bear Ridge; three-masted schooner, Maud H. Dudley. Steamers, Pennsylvania and Wm. H. Conner.

TO CUT THE GRESHAM IN TWO.

The contract for cutting the revenue cutter Gresham in two has been awarded to James W. Reilly, of New York. The work will be done at the St. Lawrence Marine Railway, Ogdensburg. The contract covers the work of cutting the boat in two, pontooning her, and delivering her to the U. S. Government at Montreal in the same condition as before.

LOCAL STEAMBOAT INSPECTORS.

An examination will be held April 25th for filling vacancies in the steamboat inspection service. Persons desiring to be examined should apply at once to the Civil Service Commission at Washington for the necessary blanks. For some reason great difficulty is experienced by the government in securing suitable men for this kind of work and yet there ought to be a large number of shipmasters and pilots who would consider the fairly liberal recompense offered an excellent equivalent for the services rendered.

CONSTRUCTION OF A NEW CAR FERRY.

The contract for the twin screw steel car ferry steamer for the Toledo and Ann Arbor Railroad Co., bids for which were opened a few days ago, has been awarded to the Globe Iron Works Co. of Cleveland. The steamer will be 270 feet over all, 259 feet keel, 52 feet beam and 18 feet 6 inches deep. She will have two sets of horizontal compound direct acting engines; cylinders 26 and 40 inches, with 36-inch stroke.

She will have four locomotive type boilers 6 feet 6 inches in diameter and 14 feet long to be allowed 125 pounds of steam. She will have four tracks and will carry 22 cars. The plans and specifications for the new boat were prepared by Robert Logan, of Cleveland, who will superintend her construction for the owners. The new boat will be smaller by 80 feet in length, 4 feet beam and 1 foot in depth, the difference between 19 feet 6 inches and 18 feet 6 inches, than the Pere Marquette, the last car ferry built, which carries 30 cars.

Work on the new boat will be started at once and according to the contract she will be completed and ready for sea October 15. She will cost about $185,000. The plates for the steamer will be made by the Otis Steel Co., of Cleveland, and the shapes will be furnished by the Carnegie Co., Pittsburg. The steamer will be operated in connection with the Ann Arbor railroad, and she will be expected to make 11 miles an hour.

NOTICE TO MARINERS.

UNITED STATES OF AMERICA—NORTHERN LAKES AND RIVERS—MICHIGAN.

TREASURY DEPARTMENT,
OFFICE OF THE LIGHT-HOUSE BOARD,
WASHINGTON, D. C., April 12, 1898.

LAKE ST. CLAIR TWENTY-FOOT DREDGE CHANNEL.—Notice is hereby given that, on or about April 15, 1898, lights, as follows, will be established to mark the lower reach of the Lake St. Clair twenty-foot dredged channel :

ISLE AUX PEACHES RANGE BEACON LIGHTS.—Front Light.—Two fixed white lens-lantern lights, 10 feet apart horizontally, in line across the axis of the channel, and 18 feet above lake level, on a cluster of piles on the prolongation of the axis of the dredged channel, in about 19 feet of water, about 2,000 feet southwesterly from its lower end. The northwesterly of the two lights will illuminate 180° of the horizon to the northward of NE. by E. ⅞ E. and SW. by W. ⅞ W., so that, in coming up the Detroit river on the Windmill Point range line, this light may be run for as soon as it becomes visible. The structure carries a white day mark.

In passing vessels must keep to the westward of this light.

Bearings of prominent objects from the light are: Outer end Grossepoint club house dock, N. by E. ¾ E. ; lower entrance (E. side) beacon light, NE. ¾ E., about 4,100 feet ; Windmill Point light-house, W. ⅝ S.

Rear light.—Two fixed white lens-lantern lights 10 feet apart horizontally, in line across the axis of the channel, and 38 feet above lake level, on a cluster of piles in about 8 feet of water, on the prolongation of the axis of the dredged channel, about 4,650 feet SW. ¼ W. in rear of the front light.

The four lights of this range mark two range lines parallel with, and 5 feet on either side of the axis of the dredged channel.

When at the upper end of the channel, about abreast of Grossepoint light vessel, with the lights open so that the rear light of one range is in range diagonally across the axis of the channel with the front light of the other range, the observer would be about 40 feet from the axis of the channel and could safely increase the apparent horizontal distance between the lights about eight times without approaching too close to the line of buoys marking the edge of the channel. About midway between the light vessel and the lower end of the channel the apparent horizontal distance between the lights may be safely increased to sixteen times, and still further increased as the lights are approached.

LOWER ENTRANCE (W. SIDE) BEACON LIGHT.—A fixed white lens-lantern light, 14 feet above lake level, on a pile cluster in about 17 feet of water on the westerly side of the lower entrance to the dredged channel.

Bearings of prominent objects from the light are: Outer end Grossepoint club house dock, N. by E. ½ E.; lower entrance (E. side) beacon light, ENE. ⅜ E.; Windmill Point light-house, WSW. ⅜ W.

LOWER ENTRANCE GAS BUOY.—On the same date this black buoy, showing a fixed white light during periods of 10 seconds, separated by eclipses of 10 seconds, marking the westerly side of the lower entrance to the dredged channel, will be discontinued.

LOWER ENTRANCE BEACON LIGHT.—On the same date the color of this light will be changed from white to red, and it will hereafter be called "lower entrance (E. side) beacon light."

By order of the Light-House Board,
FREDERICK V. MCNAIR,
Commodore, U. S. Navy, Chairman.

CLEVELAND, OHIO, April 15, 1898.

The Hydrographic Office has received the following information relating to the wreck of the schooner Groton, which sank in Lake Erie November 11, 1897, while lying at anchor 1 $\frac{9}{10}$ miles SE. of Point Talbot, Canada. The tug Snowstorm visited the wreck of the Groton on April 10, and reports that her position is apparently unchanged. The mainmast is unstepped and floating by rigging. The foremast is broken off about four feet above water. The topmasts and one gaff is hanging to rigging. There are 26 feet of water on her deck. The hull is apparently breaking up. The wreck is not in the track of vessels passing up and down the lake.

DETROIT RIVER.

DETROIT CITY HARBOR—STEAMER IONIA AGROUND—Capt. A. J. McKay, of the D. & C. steamer City of Detroit, has furnished the following information :

The steamer Ionia was running in for the docks of Detroit city harbor on April 8, 1898, and heading partly up-stream, to lay alongside the City of Berlin, which had come in lower down the river. The Ionia got too far up stream and grounded abreast the Michigan Central elevator, 100 feet from the dock line and 20 above a stake.

It is not believed the stake is a government buoy, but that it was placed by private parties to mark the lower (southern) end of a shoal on the United States side of the Detroit river. This shoal lies close to the dock line. Its upper (northern) end begins 3,960 feet below the foot of Woodward avenue, Detroit city, and extends down stream about 2,000 feet.

THE amount insured by marine insurance companies in the United States in 1890 was $134,429,084. Most of this was written by 36 foreign companies, viz., $110,410,533. The total amount paid in premiums was $1,526,453, an average percentage of .0121.

IMPROVING LAKE SUPERIOR HARBORS.

The new piers for the Duluth ship canal contract for the substructure, of which has just been awarded to King & Steele, will represent an outlay of something like $600,000. This work was made possible by the continuous contract system. When the system was adopted for the Duluth-Superior harbor and the $3,000,000 appropriation was made, covering five years for its expenditure, Maj. Sears' Corps of Engineers, U. S. A., in charge of the conservancy and improvement of harbors on Lake Superior, hoped that in the letting of a five years contract for dredging, involving such a large sum, the prices for the work would be low enough to enable him to save a large sum out of the original estimate that would warrant the construction of new piers for the ship canal. In this he was not disappointed. The piers are assured, and they will be a grand improvement.

The present ship canal is 250 feet in width. Maj. Sears finds that the increased size of vessels and demands generally of commerce call for a greater width, and in connection with the construction of the new piers the canal will be widened to 300 feet. A commission has condemned lands for the increased width desired and for the using of the government as parks on either side of the canal. The southerly pier when constructed will be 100 feet farther south than the present pier. While the canal will be widened only 50 feet, it has been decided to move the northerly pier 50 feet in a southerly direction. This will serve to move the southerly pier a full 100 feet toward the land on Minnesota Point, and will also bring the northerly pier about 50 feet out in the present entrance. When the time comes for the construction of the northerly pier it will be generally parallel to the present northerly pier and about 25 feet from it on an average. There will be a strip of water between the old and the new piers that will undoubtedly be of much service to the contractors.

The entire length of the new piers will be about 1,722 feet each, or about a third of a mile. The substructure will consist of timber cribs filled with stone and gravel, resting on piles cut off 22 feet below the surface of the water. They are to be 24 and 36 feet in width, and built in lengths of 50 and 100 feet. The cribs are designed to support the massive concrete masonry, which will be built up from a distance of one foot below low water to a heighth of from 10 to 18 feet above, and having a width of 20 feet at the base. Trenches will be dredged in which to place the cribs for the whole length of the piers to a depth of 26 feet. The cribs for the pierheads will be 36 feet wide, 100 feet in length, and finished with cut water point. The constructing of the piers is to begin with the pierheads. Temporary protecting piers will be first constructed to protect the permanent work from interruption by storms while it is in progress. The new piers will each extend lakeward about 450 feet farther than the present piers, and will be of larger proportions. The pierheads will stand 18 feet above the the normal level of the lake, and the piers proper, 10 feet. The pierheads will be built on the cut water plan, so that the shock of the waves will be lessened. The pierheads will be covered with steel plates two inches thick, and the sides of the piers in the canal will have a plating of the same material one inch thick. At short intervals along the piers will be erected electric light standards of ornamental design. Galleries will extend through the length of the piers. These were designed as much for economy of material as anything else. The superstructures will be built of blocks of solid concrete extending the full width of the piers.

Improving the waterway from Keweenaw Bay to Lake Superior, Michigan: For continuing improvement of water communication across Keweenaw Point, $450,000.

This work was formerly reported on as the Portage Lake and Lake Superior canals, across Keweenaw Point, Michigan.

In accordance with the provisions of the river and harbor act of Sept. 19th, 1890, the United States purchased and assumed the charge and care of these canals on Aug. 3d, 1891.

The improvements consist of entrance piers at the harbor entrances on Lake Superior and Keweenaw Bay, canals and canal revetments, and dredged cuts and channel ways. There are no locks.

The approved project is for a 16-foot channel 70 feet wide, a renewal of the canal revetments, reconstruction of the piers at the upper and lower entrances, and their extension to 30 and 20 feet of water, respectively, and ultimately a deepening of the channel to 20 feet, with a width of 120 feet.

The act of June 3rd, 1896, authorized continuing contracts to complete the above, except the 20 feet of depth, to the amount of $1,065,000.

As the 20-foot channel is not provided for by the above, an additional appropriation will be needed at some future time, after the above project has been completed.

The sundry civil act of June 4, 1897, appropriated $350,000 toward the continuing contracts. This will be expended under a contract dated April 13, 1897, for the construction of 2,800 linear feet of timber crib and superstructure breakwater pier at the Keweenaw entrance, work to be begun on or before May 1st, 1898, and be completed by Nov. 1st, 1900, and to cost about $120,000; in making payments on two large stone and timber breakwater piers at the Lake Superior entrance, estimated to cost $450,000 and to be contracted for this fall, and in dredging to complete the 16-foot project.

During the past season of navigation, that of 1896, the commerce through this waterway has amounted to 902,000 tons of commodities, having an estimated value of $29,954,000, and 41,262 passengers, being an increase over the traffic of 1895 of 80,000 tons, $122,000 in value, and 16,453 passengers, respectively.

During the fiscal year ending June 30, 1897, $13,391.81 has been expended in dredging to complete the 16-foot channel, under a contract August 28, 1896, in general administration, and in preparing detailed plans and specifications for the continuous contracts.

The expenses of operating and care for the fiscal year ending June 30, 1892, during which it was acquired by the United States, were paid by an appropriation of $10,000, made for the purpose by act of September 19, 1890. During the fiscal year ending June 30, 1897, $8,300 from the permanent indefinite appropriation of July 5, 1884, was expended in maintaining, by dredging, a practicable 16-foot stage of water, in superintendence and general operation of the canals,and in guarding against encroachments on the legally established harbor lines.

In addition to this the bill carries an appropriation of $8,300 for the expenses of care and operating the waterway across Keweenaw Point from Keweenaw Point to Lake Michigan.

A LARGE CARGO.

The new steel steamer Andrew Carnegie, built by the Cleveland Ship Building Co. for the Wilson Transit Line, reached Buffalo on Sunday last with a cargo of 225,000 bushels of corn, or a total freight of about 6,300 tons. On her first trip of the season the Carnegie carried 333,000 bushels of clipped oats.

The Carnegie was launched last season, and although not the largest, being twelve feet shorter than the Bessemer and Coralia, she has the same beam as the others, viz., 48 feet, and 420 feet over all. It is said, however, that her cargo capacity is fully equal to that of the longer vessels. The Carnegie is considered by experts one of the best built vessels on the lakes. She certainly carries well and handles like a yacht.

VISIBLE SUPPLY OF GRAIN

As compiled for The Marine Record, by George F. Stone, Secretary Chicago Board of Trade.

Cities Where Stored.	Wheat. Bushels.	Corn. Bushels.	Oats. Bushels.	Rye. Bushels.	Barley. Bushels.
Buffalo	662,000	1,255,000	1,563,000	45,000	136,000
Chicago	5,020,000	15,682,000	913,000	399,000	251,000
Detroit	71,000	214,000	5,000	18,000	3,000
Duluth and Superior	3,864,000	3,295,000	3,591,000	1,432,000	422,000
Milwaukee	84,000	.....	1,000	76,000	14,000
Montreal	170,000	55,000	1,098,000	47,000	41,000
Oswego	.....	.....	.....	.....	.....
Toledo	278,000	1,071,000	325,000	8,000	.....
Toronto	22,000	.....	21,000	.....	10,000
On Canal	.....	.....	46,000	.....	.....
Grand Total	29,154,000	34,917,000	12,746,000	3,076,000	1,095,000
Corresponding Date, 1897	36,979,000	24,103,000	13,657,000	3,630,000	3,293,000
Decrease	975,000	5,183,000	794,000	435,000	42,000

While the stock of grain at lake ports only is here given, the total shows the figures for the entire country except the Pacific Slope.

NEW STEEL CAR FERRY.

A report comes from Menominee in which Commercial Agent C. W. Peakle, of the Ann Arbor, is quoted as saying that the company will have another car ferry built at F. W. Wheeler & Co.'s shipyards in Bay City. It will be of steel and cost $200,000, and will be used for winter service on the Menominee-Frankfort route. This report requires confirmation, as the Ann Arbor has but just placed a contract for a new car ferry with the Globe Iron Works Co., Cleveland, and it is more than probable that it is this boat which is meant.

NOTES.

Notwithstanding the fact that the Bethlehem Iron Co., South Bethlehem, Pa., have on their books large orders for the finished guns of various calibers up to 12-gun carriages and forgings for guns which are to be completed at the various government yards, the number of orders which they are taking for merchant work, such as shafting of various descriptions, both solid and hollow, and of plain steel as well as nickel steel, are increasing daily. The products of this well known concern have a world-wide reputation, as their taking several contracts for armor plate for the Russian government proved. Last week they were asked to quote a price on shafting for a Japanese torpedo boat, which is being built in Japan. They are they only firm in this country that was asked to compete with such works as Vickers Sons & Co., England, Krupp, of Germany, and Schneider & Co., of France.

A very practical paper was read at a recent meeting of the Bristol Channel Centre of the Institute of Marine Engineers by Mr. J.F. Walliker, entitled, "Notes on Marine Boilers and Steam Pipes." In the course of it he advocated thicker end and combustion chamber plates and larger stays, the nuts on the ends of the stays being made smaller and thinner, so as to be less liable to perish from overheating. Other modifications suggested were, more space between the furnace and combustion chamber side and the shell, between the flat sides of the chambers, between the crown of the furnace and the bottom row of tubes, and that the mudhole doors should be fitted at the back end instead of the front. He remarked that the covering of boilers at the bottom, as well as at the top, seemed at last to be forcing itself on the attention of those interested. Main steam pipes were referred to at some length and the use and abuse of expansion joints. Mr. Walliker prophesied that steel in the future would be as extensively used for pipes and connections as it was now in ships and boilers.

A steamer being obliged to dry dock to make damage repairs. The vessel passed her special No. 1 classification survey of Lloyd's register, as required by the rules of that society, at the same time that the repairs mentioned in the average statement were done. She did not go into dock for the purpose of the survey, nor had the time arrived at which it was required by the rules, but as she was in dock the opportunity was taken advantage of to examine her bottom to see if reclassification repairs were necessary. No repairs were necessary for the renewal of the classification. Docking would have been necessary for the vessel to pass such survey. It was contended that the whole of the expenses connected with the repairs should be borne by the underwriters, as but for the damage by perils of the sea the vessel would never have been in dock. It was urged in defense that the expenses ought to be apportioned. It was necessary that the vessel should keep her class, and she had to go into dock for the purpose of being surveyed for her class,and the owner was bound to incur the expense of docking. It was held that if plaintiffs' claim were admitted they would recover more than an indemnity in the saving of part of the expense which they must have incurred in order to secure a renewal of the vessel's class. The case was appealed and the appeal dismissed costs apportioned on the re-classification.

Torpedo boat No. 8, christened the Rowan, was launched from the yards of Moran Bros. Co. at Seattle, Wash., on the 8th inst. The act providing for this and two other torpedo boats was passed by Congress in the appropriations for the fiscal year ending June 30, 1895. The boat has a length overall of 175 feet 6 inches; extreme beam, 17 feet; normal draft, 5 feet 6 inches; displacement, about 185 tons; freeboard forward, 11 feet, and amidships and aft, 5 feet. The vessel has twin screws. The engines, placed in separate compartments, are of the vertical, inverted cylinder, direct-acting, triple-expansion type, with four cylinders each; the low pressure cylinders being divided into two to reduce the size of casting. The indicated horse-power of the engines is estimated to be 3,200 at 395 revolutions per minute. The estimated speed is 26 knots per hour. The boilers,three in number, are of the Mosher patent tubular type. The armament consists of three 18-inches Whitehead torpedo tubes and four one-pounder rapid firing guns. The boat will be manned by four officers and twenty men. The normal coal supply is twelve tons and the total bunker capacity of 60 tons, giving a steaming radius of 1,092 knots, at a speed of 13 knots per hour. The hull is built of steel throughout, the main portions below the water line being galvanized and divided into 26 water-tight compartments,each fitted with a steam ejector for clearing of water. The coals are carried in wing bunkers outside of the compartments just mentioned, and they extend along the whole length taken up by the engine and boiler compartments.

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OUR tonnage list last week showed a fleet of forty-two vessels, costing nearly five million dollars, now under construction or completion at lake ports. To this may now be added a large railroad car ferry to be built by the Globe Iron Works Co., Cleveland, to the order of the Toledo & Ann Arbor Railroad Co. Specifications are also out for a new car ferry for the Flint & Pere Marquette R. R. Co., though it is not learned that bids have been submitted up to the present.

IT is now upon the tapis that a large vessel will be launched each week for a month from the Davidson shipyard at West Bay City. This weekly record for four consecutive weeks, if carried out successfully as intended, will be a new departure in lake shipbuilding. At present, the best annual launching record is held by a Cleveland yard, a steel steamer every 36½ days; this, too, a handful of years ago when there were not so many labor-saving tools, devices and appliances as there is at the present.

THE Shipmasters' Association as well as the Harbors of Masters and Pilots now established at the principal lake ports ought to retain as counsel for the members of their organizations, a lawyer expressly well versed in the "Rules of the Road" and the general precedents and practice of maritime law. Members of associations like the above named, are at least entitled to legal assistance when in trouble and the principal officers of the order are, or would be remiss in their watchful care, etc., over the rights and welfare of their brother members by permitting any one to drop by the wayside through not having a proper legal and technical representation, when their conduct or action was in any way reflected upon while in charge of the pilotage of a vessel.

THERE is now every indication that shipbuilding and kindred interests will be much more brisk in the near future than it has ever been in the past history of the country. Naval, departmental and the merchant marine has received quite a shaking up during the preliminary stages of the Spanish question, and the attention of the government as well as all classes of citizens has been fairly well directed towards American shipping and the floating requirements of the nation. It is safe to assume that should such a necessity arise again, a more capable class of vessels, and a greater number of them will be placed at the disposal of the government. Transports, for troops, stores, fuel, etc., will always be available from the merchant marine service, and many high classed steamers yet to be built, will be subsidized for this purpose, thus giving an impetus to American shipbuilding which no other condition less than this national shaking up could have brought about.

LIENS FOR SUPPLIES.

Unlike other countries, the person who furnishes supplies and materials in a vessel's home port has no lien by the maritime law of the United States. In case the vessel belongs to the same state, our maritime law presumes that the supplies are furnished on the credit of the owner, and that a lien is unnecessary. This leaves the entire matter of supplies to and liens upon domestic vessels to be regulated by the diverse statutes of the several states. It leads to great complexity, and makes difficulty and expense to a vessel purchaser who wishes to assure himself that there are no incumbrances on the property which he is buying. Over twenty years ago the evils of these regulations of state liens were pointed out by the Supreme Court.

In the Lottowanna (21 Wall., 582), Judge Bradley, delivering the opinion of the court, said:

"And of course, as before intimated, this jurisdiction of the State legislatures in such cases is subject to be terminated at any time by Congress assuming the control. In some cases this is not so desirable as in others, but in the one under consideration, if Congress has the power to intervene, it is greatly to be desired that it should do so. It would be better to have the subject regulated by the general maritime law of the country than by differing State laws. The evils arising from conflicting lien laws passed by the several States are forcibly set forth by Chief Justice Taney in the case of the St. Lawrence, before cited. It may be added that the existence of secret liens is not in accord with the spirit of our commercial usages, and a uniform law by which the liens in question should be required within a reasonable time to be placed on record in the custom-house, like mortgages, and otherwise properly regulated, would be of great advantage to the business community."

LICENSE OFFICERS OF SAILING CRAFT.

While the laws regarding the Government inspection of steam vessels may be assumed to insure upon them the necessary security of life and property at sea, so far as the strength of the vessels, proper equipment, etc., are concerned, no such provisions exist by law with regard to sailing vessels. A totally unseaworthy sailing vessel may be put to sea at the risk of all lives and property on board; furthermore, she may be overladen and utterly deficient in the necessary equipment for the safety of her crew and passengers in case of accidents, such as boats, life-rafts, life-preservers, pumps, etc., or fire-extinguishing apparatus. There is, moreover, no legal requirement as to the qualifications of officers of sailing vessels, and no certificate of qualification is required by law of such officers. If the owners or insurers do not require some evidence of competency, any man may obtain command of a sailing vessel, however unfit he may be for the position.

FOREIGN BUILT TONNAGE DOCUMENTED.

During the past four years 38,828 tons of foreign-built vessels have been admitted to American registry, compared with 64,778 tons for the previous four years. Of this total of 103,606 tons for eight years, 55,902 tons were admitted by special acts of Congress, including the act admitting the Paris and New York, and 47,704 tons were admitted as repaired wrecks by the law, pursuant to section 4136, Revised Statutes. Of this last named amount 21,175 tons have been admitted during the past four years.

WITH one total loss this spring and a number of lesser casualties on account of trying to force vessels through the Straits of Mackinac before the ice had cleared out, vessel-owners, bearing this fact in mind, can in the future effectually check all clamor from shippers or consignees, who wish to force the vessels out of port before navigation is practically open. Vessels are not owned for the purpose of keeping them tied up to a dock nor for any other reason or purpose than is included in a legitimate business enterprise or venture, shippers may charter and underwriters insure, but the handling of floating property is solely in the hands of the owners, both in accepting charters and paying insurance premiums, as in all other matters relating to the welfare of the craft. No individual owner has yet been proceeded against in an action for damages by refusing to leave port in the spring, nor has he ever vitiated his insurance policy by not placing his property in jeopardy through having to pass through fields of ice when a few days delay would see clear navigation. The owner may seek counsel and advice, receive all possible information, etc., relative to the condition of the ice fields and at the same time be thoroughly conversant with the ice breaking qualities (if any) of his vessels, but on him and him alone rests the final responsibility of the venture, notwithstanding the fact that he may find some means of partly recouping his loss, such for instance, as insurance on ship, freight or cargo.

THE present Commissioner of Navigation, Hon. Eugene T. Chamberlain, in his annual report makes the following very pertinent remarks: The opportunities for independent command and promotion are decreasing, as large steamships perform the carrying formerly done by many sailing vessels. The attractions of the sailor's life are passing away, as the tasks of the larger part of the crew have to be done deep in the hold, in heated engine and boiler rooms, instead of on the deck and in the rigging, and there are few natural inducements to lead the American to the sea. To what extent it is worth while to undertake to supply by legislation artificial inducements is a question which will be differently answered as one may be swayed the more by business or sentimental considerations. When it is difficult to induce American citizens to ship on American vessels, any requirement that a certain part of the crew, outside the watch officers, must be citizens, adds to the disadvantages under which American shipowners already labor in competition with foreign shipowners. Such a requirement should not be exacted unless coupled with some compensating advantage.

FOR the fiscal year ended June 30, 1897, the total construction of vessels, 891 of 232,233 gross tons, was the largest annual output since 1891 when it reached 1,384 vessels, of 369,302 tons. The year of our greatest construction was 1855, when we built 2,027 vessels, of 583,450 tons. The Great Lakes region, for the first time in the history of the country, built more tonnage last year than all the rest of the United States ports combined, viz: 120 vessels, of 116,937 tons, compared with 771 vessels, of only 115,296 tons.

THE CORPS OF ENGINEERS, U. S. A.

Gen. Wilson, chief of engineers, has furnished to the Secretary of War a list of engineer officers, who, with few exceptions are available for immediate service with the army in the field. It is most comprehensive in character, and includes the names of nearly every officer of the engineer department throughout the United States. In order to take care of the important river and harbor and other engineering works in charge of these officers it probably will be necessary in particular cases where the works cannot be entirely neglected to greatly increase some of the duties of the officers in order that the service of others may be availed of in military field operations. In a majority of cases, the names are given with the general idea that the officers will not be called away from their present duties for more than a few months. In event of hostilities it is the province of the engineer officers of the War Department to form a corps especially detailed to assist the army in the field in engineering projects.

EASTERN FREIGHTS.

Messrs. Funch, Edye & Co., New York, report the following situation in the eastern freight market: The list of charters for grain falls considerably short of a satisfaction of the demand for large tonnage to take mixed cargo of heavy grain and oats for picked ports. The reason for this rests on the fact that owners, in view of the impending war between the United States and Spain, are generally withholding their vessels from the market, although a higher range of freights could doubtless be established if owners would place a price upon their tonnage. Berth freights show an advance, whilst the enquiry for smaller boats suitable to Cork f. o. business is not active, and the demand for tonnage for special trades is not urgent. Timber freights from the Gulf ports are, however, fully holding their own, and vessels' demands of some advance in most directions are gradually being responded to by shippers.

Business in sail tonnage for the past week has again been very limited, and the alarming aspect of the political situation tends to still further restrict transactions. Under these circumstances the small number of charters accomplished since our last is easily accounted for, but we can report no actual change in rates, which nominally continue firm.

A NEW SECRETARY OF THE NAVY.

Rear-Admiral Jno. G. Walker, retired, may be the successor of Theodore Roosevelt, as Assistant Secretary of the Navy. Rear-Admiral Walker has been a member of the naval strategic board and is thoroughly in touch with the plans of attack and defense prepared both by the war and navy departments. His experience in command of the two naval squadrons, his handling of delicate diplomatic questions in the past and his general and varied knowledge of naval requirements peculiarly fit him, his friends declare, for appointment as Mr. Roosevelt's successor.

COLLISION CASE.

ROCHESTER VERSUS SCHOONER A. MOSHER.

The decision of the United States Circuit Court of Appeals for the Seventh Circuit in the collision between the steamer Rochester and the schooner A. Mosher, shows but another instance where the steamer is not held always at fault for colliding with a sailing vessel, notwithstanding, as the counsel for the Mosher pertinently quoted "The Fannie" II Wall, 238, 243.

"Where a schooner and steamer are approaching each other, the steamer is bound to keep out of the way of the schooner, and allow her a free and unobstructed passage. The duty of the schooner is to keep her course. Whether the lookout on the schooner was sufficient, can make no difference where the want of proper lookout did not contribute to the disaster."

If the schooner held her course, it was all that the law required, all that the steamer could expect, and all that was necessary.

At about eight o'clock P. M. of the 4th day of November, 1895, the steamer Rochester collided with the schooner Amoretta Mosher on Lake Michigan, near Chicago. The night was clear, there was little sea, and a fresh breeze was blowing from the southward. The schooner was light, bound on a course North by West half West, and the steamer loaded, was bound for Chicago, and until just before the collision, was on a course South by East. Both vessels were injured in the collision.

The District Court decided that the schooner was solely at fault, dismissed the libel and entered a decree in favor of the steamer's damages. It was claimed by the schooner that with her side lights properly placed and burning, she was towed out of the Chicago river into Lake Michigan, and put on her course North by West half West. While sailing on this course the master was at the wheel, a man was forward on the lookout, and the rest of the crew were setting sail.

The red light of the Rochester was first seen on the port bow of the schooner bearing about two points, and a torch or flash light was shown from the port quarter of the schooner.

Some little time after that the steamer was seen on the schooner's starboard side showing her green light. This brought the vessels into a position of starboard side to starboard side, or green to green. The vessels continued approaching until suddenly the Rochester swinging under the port helm to the westward crossed the schooner's bows, so that before the schooner could make but a slight change in her course, she struck the steamer on the port side.

On behalf of the steamer it was contended that when the schooner was first discovered, her green light was seen nearly ahead, a little on the starboard bow. Immediately seeing this light, the captain says he ordered the helm a starboard. As soon as this order was given the schooner showed a red light, closing out her green light. The captain then immediately gave the order of "steady", "port," and "port hard," blew the whistle one blast, and sent a man into the pilot-house to help the wheelsman at the wheel. The steamer swinging rapidly under the port helm to the westward, was overtaken by the schooner, also swinging to the westward, and struck on the starboard side.

The charge against the schooner is, that she changed her course, and thereby misled the steamer, so that she ported and swung to the west, and then the schooner starboarded and turning to the west swung into her.

From the summing up of the case it is learned that the schooner was adjudged at fault solely because she did not keep her course previous to and at the moment of the collision. It was shown that she not only did some great yawing, but that with the wind on her port quarter she had luffed up into the wind and from her apparently erratic action mystified the steamer to a very great extent. The steamer blew her passing signal all right, but it would have been much more significant to the schooner if she had heard the alarm signal from the steamer. It has been critical navigation getting into Chicago when a fleet of sail craft were bound out with all hands engaged making sail and the vessels yawing within a hand full of points. For the past dozen years steamers have been compelled to excercise the greatest caution and they will have to continue so to do until the sailing fleet become extinct or nearly so, however, each season sees them lessening wonderfully and it won't be but a few years until the lumber trade into Chicago will be carried on by small steam craft and there is possibly an opening for suitable steamers to enter the trade even now.

NAVAL NURSES.

Surgeon General Van Reypen of the navy is being almost inundated with applications from women all over the country for positions as nurses on the hospital ship Solace. The applications have averaged about twenty a day since the war excitement began. The situation is very embarrassing to the surgeon-general, he says, for the reason that the law practically prohibits the employment of women on shipboard. All persons so employed must be regularly enlisted in the navy, a pre-requisite to which is a severe physical examination. Eight male graduates of the New York Training School for Nurses have already been enlisted for service on the ship, and it will be impossible for women to serve in that capacity. These men are rated as ships' cooks, second class, and receive pay at the rate of $30 per month. There is nothing in the law, however, which will prohibit the employment of women as nurses at the army and navy hospitals on shore, and it is possible that many of the patriotic women who have volunteered to serve in that capacity may be so assigned.

LIFE-SAVERS AS COAST GUARDS.

Supt. S. I. Kimball, General Superintendent of the Life-Saving Service, has conferred with Assistant Secretary Roosevelt on employing the men of the coast service in a regularly organized system of reporting war vessels sighted at points remote from ordinary ports of entry. Such a system will be a valuable adjunct to the regular observation service.

LAKE SUPERIOR LUMBER.

One or two lumber charters have been made at association rates, it is said, from Duluth to Ohio ports. This rate is $1.62½. Shippers are still standing quite firmly against the association rates, and in regard to the one or two charters reported to have been made at association rates, they say that these are not sufficient to establish the rate, any more than one swallow makes a summer.

The lumber companies on the Canadian side of the boundary expect a big business this season. The Rat Portage Lumber company has increased the capacity of its No. 1 sawmill, and doubled the capacity of its planing mill. The Keewatin Lumber company has added largely to its manufacturing equipment. The year's product of the two companies will be 50,000,000 feet.

WIPING OUT A SLUR.

In the Century there is an article by Gustav Kobbe on "Heroes of the Life-Saving Service," in the Series of "Heroes of Peace." Mr. Kobbe says:

Circumstances singularly pathetic surround the loss which befell the crew at Peaked Hill station, near Provincetown, Cape Cod. Keeper Atkins, of this station, was one of the true and trusted veterans of the service. But one stormy day in winter, after twelve hours exposure on the beach, exhausted by futile efforts to launch the surf-boat, he and his crew had the mortification of seeing the rescue they had attempted made by a crew of volunteers. It mattered not that these had made no previous exertions, that they had come fresh and unwearied upon the scene; Keeper Atkins and his crew had to take from the community what, in the staid, old fashioned speech of the Cape is known as the "goading slur." The keeper made no attempt to answer his critics; but gradually, as that season and the following summer wore away, a settled look of determination became stamped on his face, and his bearing took on a dignity almost tragic. When, at the opening of the next season, his wife, as he left his home for the station, begged him not to expose himself to needless danger, he replied:

"Before this season is over I will have wiped out the 'goading slur.'"

Reaching the station, he called his crew about him, and informed them that, no matter at what peril, a rescue would be attempted at every wreck within the limits of the station.

That winter a storm of almost unprecedented fury burst over the coast, and a vessel was swept upon the Peaked Hill bars. A surfboat, launched by seemingly superhuman power, put out from the shore. But neither desperation nor even madness could keep a boat afloat in such a sea; and when, one after another, those who had braved it were cast upon the beach, three were dead. One of these was Keeper Atkins. He had wiped out the "goading slur."

Of such stuff are the heroes of the life-saving service.

THE DETROIT NAVAL RESERVES.

The certain prospect of war fills the Detroit naval reserves with joy. They are not so very anxious to begin holy stoning the deck or sitting down at a table supplied at the cost of 18 cents a day, but they are anxious to receive some return for the arduous labor they have gone through the past week.

They have been drilling at the guns, with rifles, and pulling a heavy boat with 18-feet ash oars over Detroit river, with the consequent blistered hands and aching muscles. Now they want to find out why they had to do all of those things.

"But the hard work hasn't dampened our patriotism a bit," said one of the boys who is too modest to permit the use of his name. "We are more determined than ever to die for the cause of Cuba, if necessary. We have sworn to nail the flag to the mast and never surrender. When the Yosemite goes down it will be with banners flying and the band playing the 'Star Spangled Banner.' The strains of the music will float over the water until the end, and the last sound we shall hear will be the gurgle of the water in the band instruments."

In addition to the drill on the water the reserves are put through land evolutions.

They are showing much skill, and both the officers and men are learning how to bear the responsibilities of their positions.

COMPASS CORRECTIONS.

What seem to us very clear and concise directions for finding the deviation of the compass by observation of fixed objects, or the correction for deviation and variation combined, has just been issued by the Coast and Geodetic Survey in reference to magnetic ranges established in a harbor as follows :

HOW TO FIND THE DEVIATION OF THE COMPASS.

The vessel should be steadied from two to three minutes on the compass course whose deviation is required before arriving on the range selected.

The difference between the bearing of range by compass and the magnetic bearing of range will be the deviation of the compass for the point on which the ship heads, keeping in mind that if the magnetic bearing of range is to the right of the bearing of range by compass the deviation will be east, and if to the left, west.

1. Ship's head, when on range, NW. per compass :
   Magnetic bearing of range..... S. 44° 54′ W.
   Bearing of range by compass..... S. 40° 00′ W.
   Deviation per compass for ship's head NW. 4° 54′ E.
2. Ship's head, when on range, SW. per compass:
   Magnetic bearing of range..... N. 30° W.
   Bearing of range by compass..... N. 25° W.
   Deviation per compass for ship's head SW. 5° W.
3. Ship's head, when on range, SE. per compass:
   Magnetic bearing of range..... N. 53° 54′ E.
   Bearing of range by compass..... N. 50° 00′ E.
   Deviation per compass for ship's head, SE. 3° 54′ E.
4. Ship's head, when on range, NE. per compass:
   Magnetic bearing of range..... S. 31° 48′ E.
   Bearing of range by compass..... S. 30° 00′ E.
   Deviation per compass for ship's head, NE. 1° 48′ W.

HOW TO FIND THE COMPASS ERRORS.

Those desiring the compass error, on any heading, should apply the variation say 16° 46′ E. to the deviation found on that heading, always keeping in mind that the error is composed of the deviation and variation combined according to their signs, remembering that easterly deviation and variation is represented by a plus sign, and westerly deviation and variation by a minus sign. Then we have the formula :

$e = d$ plus v

Where e=error, (—) W., (plus) E.
d=deviation, (—) W., (plus) E.
v=variation, (—) W., (plus) E.

Wishing to get the error from the previous examples, variation being 16° 46′ E., or using sign (plus) 16° 46′ :

1. Deviation per compass for ship's head NW. was found to be 4° 54′ E., or, using sign, plus 4° 54′. Remembering the formula $e=d$ plus v, we have $e=$ plus 4° 54′ plus 16° 46′= plus 21° 40′, or the error on NW. is 21° 40′ E.
2. Deviation per compass for ship's head SW. was found to be 5° W., or —5°. Variation same as above.
   Then $d=$ — 5°
   v=plus 16° 46′
   e=plus 11° 46′, or the error on SW. is 11° 46′ E.
3. Deviation per compass for ship's head SE. was found to be 3° 54′ E., or plus 3° 54′. Variation same as above.
   Then d=plus 3° 54′
   v=plus 16° 46′
   e=plus 20° 40′, or the error on SE. is 20° 40′ E.
4. Deviation per compass for ship's head NE. was found to be 1° 48′ W., or —1° 48′. Variation same as above.
   Then $d=$ — 1° 48′
   v=plus 16° 46′
   e=plus 14° 58′, or the error on NE. is 14° 58′ E.

MR. C. P. COLEMAN, formerly general storekeeper of the Lehigh Valley Railroad Co., has resigned to accept a position of purchasing agent of the Bethlehem Iron Co., South Bethlehem, Pa.

MARSHAL'S SALE.—THE A. D. HAYWARD.

Under commission of appraisement and sale issued out of the Exchequer Court of Canada, Toronto Admiralty District, there will be offered for sale by public auction on board the Propeller "The A. D. Hayward," now lying at Wallaceburg, at noon on Thursday, the 28th day of April, A. D., 1898, the hull, rigging and appurtenances of the Propeller "The A. D. Hayward," enrolled at Detroit, Michigan, as a United States vessel.

The engine, boilers, shafting and propeller wheel have been removed, otherwise she is complete in all respects. Classed A 1. Built at Manitowoc, Wis., in 1887. Length, 137.9 feet; breadth, 28.6 feet; depth, 10.8 feet; tonnage, 304.94.

Terms, 25 per cent. cash at time of sale. Balance within 14 days. Further terms made known at time of sale, or may be had from the undersigned.

Dated at Toronto this 12th day of April, A. D. 1898. WM. BOYD, Marshal; A. B. CARSCALLEN, Solicitor, Wallaceburg, Ont.; THOS. MULVEY, Solicitor, 2 Toronto St., Toronto. 12 April 1898.

THE ART OF SHIPBUILDING.

A most interesting and instructive article on "The Building of a Ship," by Lewis Nixon, appeared in the March number of Cassier's Magazine. It treats of a ship's design, construction, and general machinery equipment, a subject that has probably never before been published in so concise a manner, and yet embodying the principal features, for the public's edification. It gives the first step toward the building of a new ship, continuing with the vessel's different stages of construction and finally ends with her ready to go into commission. What adds to the comprehensiveness of the article is the illustrations with which it is interspersed. In speaking of the building of vessels for the government, Mr. Nixon says elaborate plans and specifications are gotten out and the lowest bidder generally gets the contract. But as the form or method of contracting does not affect the process of construction in the mechanical sense, it is not pertinent to discuss it, except to say that experience has not demonstrated the merit of superior economy in the government system as compared with that commonly pursued in the work for private account. Passing to the commercial side of shipbuilding, the writer said "where you can find twenty men who can design and build an engine, you cannot find one who can tell you what it cost. It is difficult to give any figures on costs of ships. Battleships like the Indiana, cost for hull and machinery about three hundred dollars per ton of displacement. The cruiser Baltimore cost the same. A passenger steamer will cost from one hundred to two hundred dollars per ton of displacement, depending on the speed and finish. The only sure way to estimate on the cost of ships is by comparison, so that an old-established yard, in which have been built all sizes and classes of ships, whose cost has been carefully kept, has an important advantage over a new yard. The adage that 'fools rush in where angels fear to tread,' is forcibly illustrated often in bidding on vessels, where the amateur on such work, basing his figures upon some vessel whose price he knows or thinks he knows, is awarded a contract at a price far below veteran ship yards, and naturally finds that he cannot build the ship for the money. You can trust to luck in many things, but it is never safe to do so in estimating cost. Naval architecture is one of the greatest of professions, and one in which excellence is justified from the fact that defects in a ship, like murder, will out. An architect for a house may build his house too strong and so much heavier than it need be, but Mother Earth is patient and bears the added weight without protest. But build your ship too strong, and you lose in cargo capacity; build her too light and Old Ocean will certainly find her weakness."

IRON ORE SALES.

A Duluth dispatch has the following regarding large ore sales:

It is estimated that at this date, before a pound of ore has been shipped from Lake Superior ports, the sales of ore for this year's delivery exceed 10,000,000 tons, or more than the entire shipments of any year preceding the last. Indeed, so tremendous has been this buying movement that the full year's product of many classes of high-grade ore is entirely sold out. For the remainder of the year it will be almost impossible to obtain Bessemer ores from the Marquette or Vermilion ranges, while the mines of the Gogebic, Menominee and Mesaba have comparatively little to dispose of. Low-grade ores, high in silicon or phosphorous, or both, are still to be had, and it looks as if they would bring better prices before the season is over than was expected.

In all, the ore sales of the past five weeks represent a value of about $28,000,000.

The Carnegie and Oliver steel companies, which own mines in three of the lake ranges capable of an output of over 3,000,000 tons, are evidently not content with this vast total for their business, and have in the past week bought 300,000 tons of Mesaba ores from the Rockefeller and Franklin companies. The Carnegie Steel Co. has made the discovery since it began the use of its new furnaces that it can greatly increase the proportion of the cheap Mesaba ores in its furnace mixtures. This will enable it to produce iron at a still smaller cost than before.

Several Minnesota mines have lately been sold. Zenith has been bought by the Oliver Mining Co., for about $150,000 bonus above the 30-cent royalty rate. It will be improved at once. Sellers has also been purchased by the Consolidated Company.

Shipments are in progress to the dock from all the five ranges, and vessels are expected at Escanaba in a day or two to take ore to Chicago. Navigation on Lake Superior will not be open for a week.

TRANSFER CHARGES AT BUFFALO.

Buffalo's avaricious elevator men will not relinquish their hold on the grain trade if they can possibly avoid it. One of them made a bluff at doing so long before the season of navigation had opened, but when the grain commenced to move toward Buffalo, he, with the others, was willing to agree to charge at least five-eighths of a cent for all grain transferred from lake vessels.

The threat made by Mr. Kellogg last month to reduce the charge to one-eighth of a cent per bushel scared the recalcitrant elevator men into accepting a temporary truce, which will no doubt be followed by a revival of the old agreement to bleed the trade to the extent of seven-eights of a cent a bushel on all grain shipped via Buffalo.

While the greedy elevator men are scheming to exact all they can from grain shippers using that route, the New York Legislature and the New York Chamber of Commerce have been working to secure the improvement of the canal and the cheapening of that route so as to divert export grain to the Erie canal route. Unless the Buffalo elevator men reduce rates soon and keep them down, some more of the Western elevator men, who are permitted to deal in the public's grain, will erect elevators at that port. The Chicago elevator men especially are not disposed to submit to exactions, when they become as heavy as the Buffalo elevator charges.

An effort will also be made to reduce the New York harbor charges, but at the same time the charges all along the St. Lawrence route are being reduced and the Parry Sound route is being prepared for a large share of the business. It is to be regretted that the Empire State has not had a legislator shrewd enough to see what was needed and influential enough to secure it. If the pool is able to maintain the old rates, shippers who have no elevator at Buffalo or Chicago cannot compete with those who have.—The American Elevator and Grain Trade, Chicago.

CONCERNING LAKE SUPERIOR.

Lake Superior is, to begin with, the largest body of fresh water in the world. It is water of wonderful purity, which it holds, too; and some time, and in the not very distant future, either, the people who live in the large cities to the west and south will come to this lake to get the water for their homes. It will not be so remarkable an engineering

feat to pipe the water of this lake, pure and sparkling and fresh from its cold depths, to these cities which are now struggling with the question of their water supply and meeting all sorts of difficulties in their efforts to get water fit to drink.

All down through this thousand feet of blue there is a peculiar coldness. At the very most the temperature varies through winter and summer not more than 6°. Winter and summer this great lake never changes to any appreciable extent, so that if you dip your finger tips in the blue surface on a day in July, or if you test it some day in the early winter when you have been out on some belated, ice-mailed fishing smack, or when you have gone out to watch the fisherman spear their supplies through the thick ice in mid-January, you will find but a trifling difference in the temperature. Away down at the bottom, too, there is but little variation in the temperature, for it stands at nearly 40° Fahrenheit at the bottom, and varies from 40° to 46° winter and summer, at the surface. The other lakes, though cold, are not in this respect like Superior.

The whole bottom of the lake is believed to be a strong rock basin, though it would seem that there must be great springs at the bottom to help keep up the enormous volume of water. From the north there is a large amount of water pouring into the lake year in and year out, the swift-rushing, narrow-banked Nipigon, and other streams furnishing no small part of the supply. These streams in a large measure make up for the loss from the surface. One of the old lake captains—a bronzed, kindly-faced old man, who had been for thirty years on the lakes and had faced death many a time in the frightful storms which sometimes sweep across these beautiful bodies of water—told me, as we were passing along one day near the north coast of Superior with the headlands and inlets and glossy green bluffs of that most picturesque shore in full view, that the theory that the lake was slowly going down in size was true. He maintained that he could tell from certain land marks along the shores, with which he is as familiar as he would be with the streets of his old Scottish birthplace, that the lake was slowly—very slowly—but surely receding. However, it will be some centuries yet before there will be any appreciable lessening of the Great Lakes, so that we need not be concerned.

Strange as it may seem, the lake has tides, too, well defined tides, discovered in 1860. It is what is called a self-registering tide, with a regular flux and reflux wave, caused, so the scientific men say, by the sun and moon. The average rise and fall every twenty-four hours is 1 14-100 of a foot; the maximum tide at new and full moon is 1 28-100 of a foot.—St. Nicholas.

INSTITUTION OF NAVAL ARCHITECTS.

The spring meeting of the British Institution of Naval Architects was held in London, on 30th and 31st March, and 1st inst. The first day's proceedings commenced with the reading of the annual report of the council, after which the election of president, officers, and council was proceeded with. This was followed by an address by the chairman, the Earl of Hopetoun, G.C.M.G. The papers read on the first and subsequent days of the meeting comprised the following: "Recent Trials of the Cruiser Diadem," by Sir John Durston, K.C.B., R.N., Engineer-in-Chief of the Navy, vice-president; "Riveting by Electricity," by Herr F. von Kodolitsch; "Investigation of the Nature of Surface Resistance of Water and of Stream Line Motion under Certain Experimental Conditions" (second paper), by Professor Hele-Shaw, L.L.D.; "Horse-Power Absorbed by Skin Friction and Wave-Making in Ships of Different Forms and Proportions, as deduced from Progressive Trials," by Mr. James Hamilton; "Submarine Torpedo Boats: Their influence on Torpedo Boat Architecture, and Their Value in Warfare," by Captain W. H. Jaques, late U. S. Navy; "Experiments on the Effect of Direction of Turning in Twin Screws," by Mr. R.E. Froude, F.R.S.; "Trunk-Deck Steamer Oscar II.," by Mr.W. Hok; "Reminiscences of Early Marine Steem Engine Construction and Steam Navigation in the U. S. of America from 1807 to 1850," by Mr. Chas. H. Haswell; "Description of Some Experiments with a Water-Tube Boiler," by Mr. A.F. Yarrow, vice-president; "Discharging Grain Cargoes by Pneumatic Means," by Mr. F. E. Duckham; "A General Theory of Oscillations of a Ship on Waves," by Captain A. Kriloff, I.R.N.; "On the Stresses of a Ship in a Seaway," by Captain A. Kriloff, I.R.N.; "The Problem of Stability in Naval Architecture," by Herr L. Gumbel, of Berlin; "Minimum Net Register and its effect on Design," by Mr. A. Ramage; "Note on the Steering Qualities of the Yashima," by Mr. Philip Watts; "On Resistance to the Motion of Solids in a Fluid," by Herr B. Schieldrop, of Bergen, and "On the Direct Attachment of Copper Sheating Plates to the Hulls of Vessels," by Mr. Leopold Roper.

Some rapid grain handling is reported from Milwaukee. Nye, Jenks & Co., of that city are breaking the record. Last week 196,650 bushels of oats were run into the steamer Harvey H. Brown in ten hours, although the bins containing the grain were located at points remote from the shippers. On Sunday 110,000 bushels of corn were run into the steamer Thomas Cranage, and the time that elapsed between the beginning of weighing and putting on hatches was only four hours and fifteen minutes. Equally good work was done on the steamer Sitka, which completed a cargo of 92,500 bushels of rye in three hours and fifteen minutes. The Sitka went under the spouts at 3 o'clock in the afternoon and by 6:15 had finished loading. As time counts in handling cargoes, particularly when freights are low as at present, records such as these are calculated to put carriers in a pleasant frame of mind.

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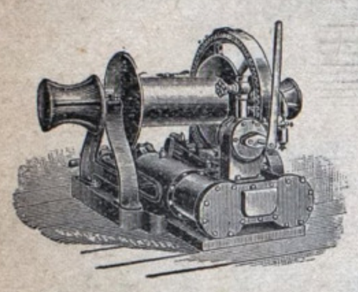

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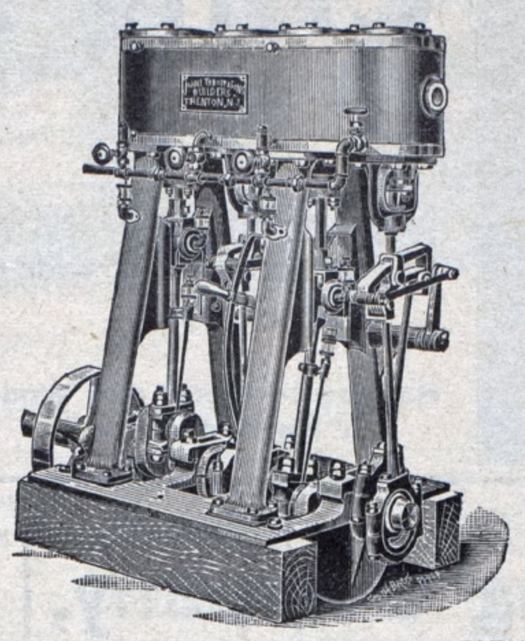

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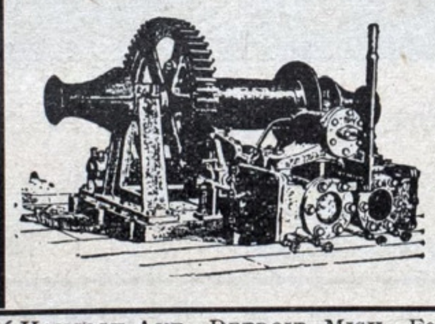

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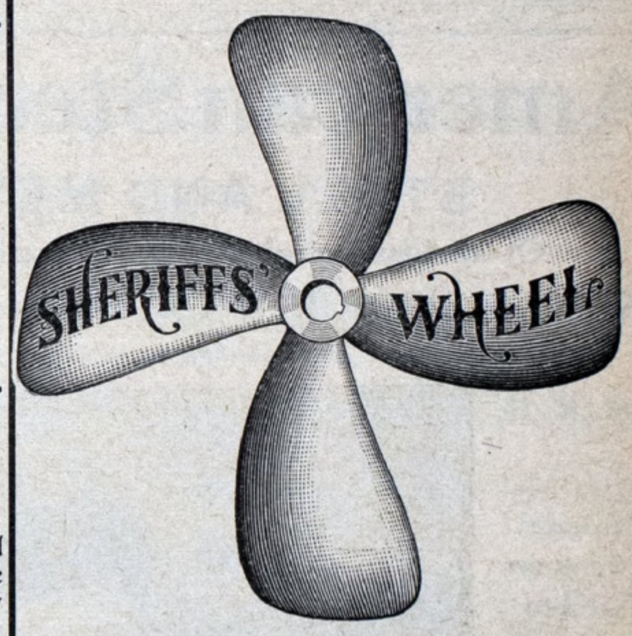

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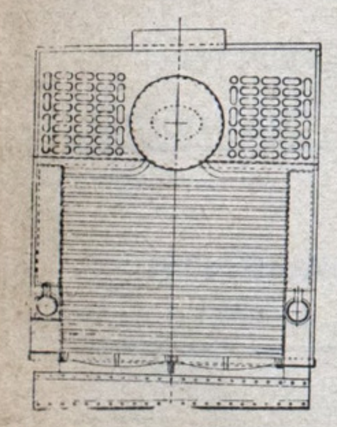

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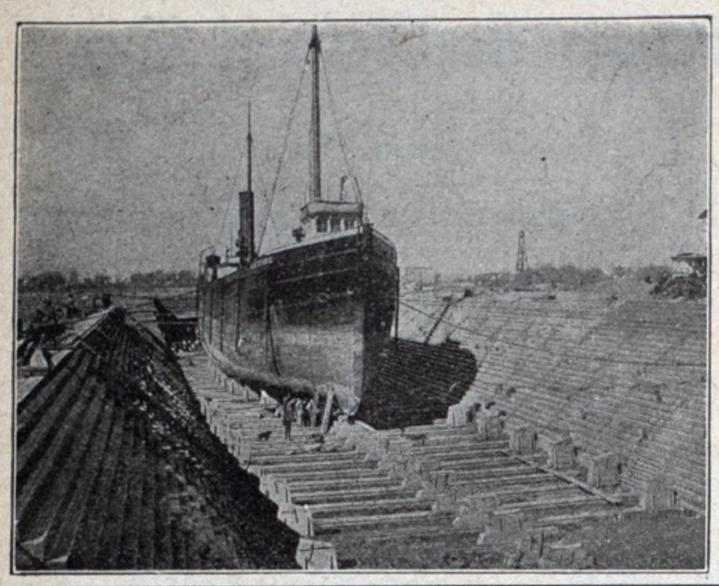

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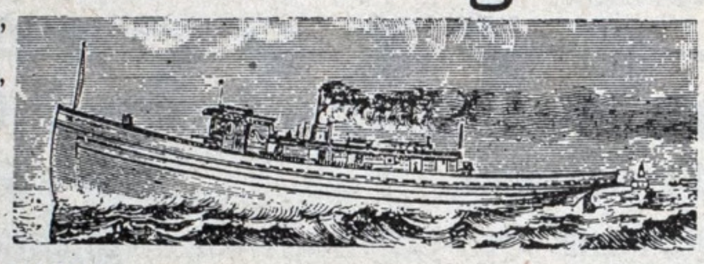

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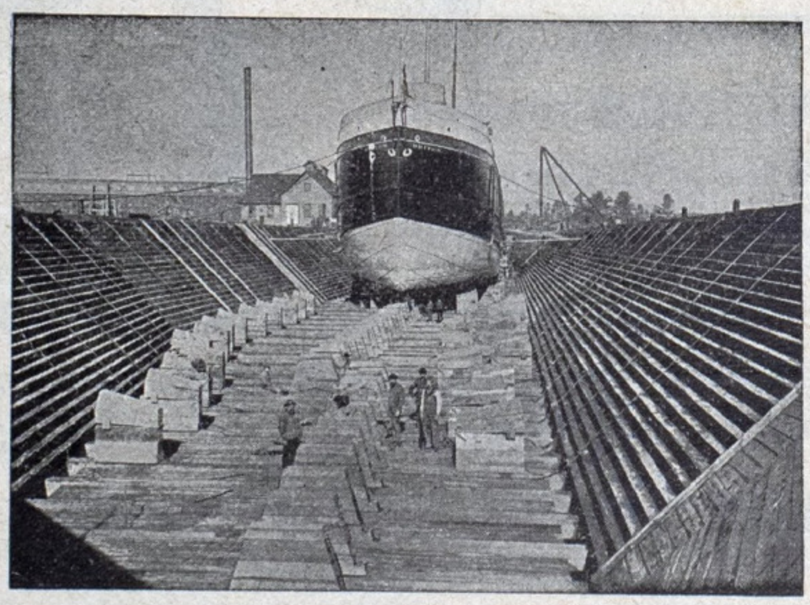

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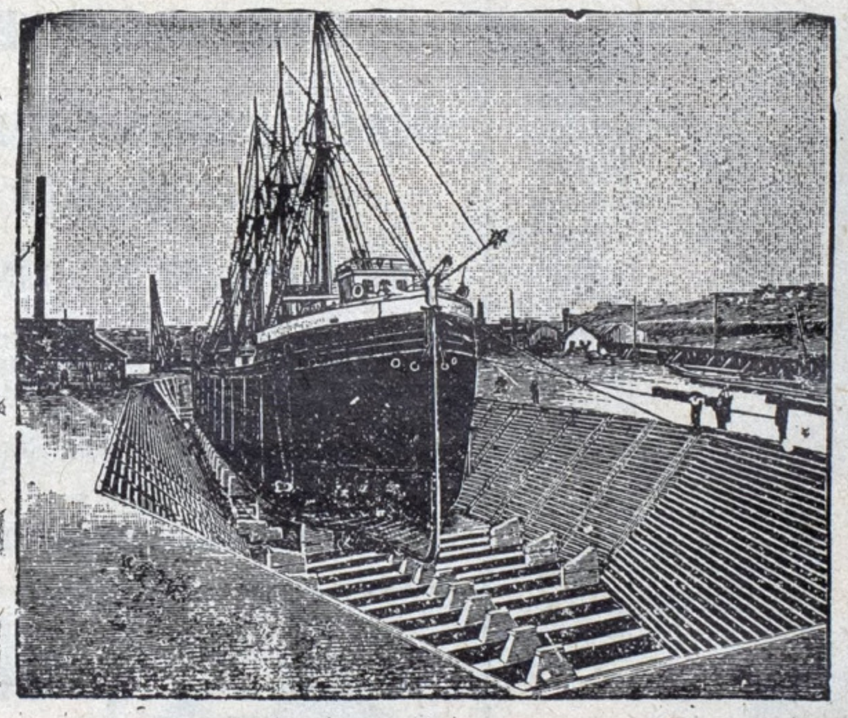

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